Please cancel claim 2 without prejudice to subsequent revival.

All pending claims are provided in Appendix I for the Examiner's convenience.

1. (once amended) An isolated nucleic acid encoding a sensory transduction G-protein coupled receptor, the receptor comprising greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the nucleic acid encodes a receptor that specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

9. (once amended) An isolated nucleic acid encoding a sensory transduction G-protein coupled receptor, wherein the nucleic acid specifically hybridizes under highly stringent conditions, which end with a wash step at 65°C in a solution comprising 0.2x SSC and 0.1% SDS, to a nucleic acid having the sequence of SEQ ID NO:4, SEQ ID NO:5, or SEQ ID NO:6.

10. (once amended) An isolated nucleic acid encoding a sensory transduction G-protein coupled receptor, the receptor comprising greater than about 70% amino acid identity to a polypeptide having a sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the nucleic acid selectively hybridizes under moderately stringent hybridization conditions, which end with a wash step at 45°C in a solution comprising 1x SSC, to a nucleotide sequence of SEQ ID NO:4, SEQ ID NO:5, or SEQ ID NO:6.

11. (once amended) An isolated nucleic acid encoding an extracellular domain of a sensory transduction G-protein coupled receptor, the extracellular domain having greater than about 70% amino acid sequence identity to [the extracellular domain of SEQ ID NO:1] amino acids 1-563 of SEQ ID NO:1, wherein the extracellular domain specifically binds to polyclonal antibodies generated against amino acids 1-563 of SEQ ID NO:1.

13. (once amended) The isolated nucleic acid of claim 11, wherein the nucleic acid encodes [the extracellular domain of SEQ ID NO:1] amino acids 1-563 of SEQ ID NO:1.

A3

14. (once amended) An isolated nucleic acid encoding a transmembrane domain of a sensory transduction G-protein coupled receptor, the transmembrane domain comprising greater than about 70% amino acid sequence identity to [the transmembrane domain of SEQ ID NO:1] amino acids 563 to 812 of SEQ ID NO:1, wherein the transmembrane domain specifically binds to polyclonal antibodies generated against amino acids 563-812 of SEQ ID NO:1.

16. (once amended) The isolated nucleic acid of claim 14, wherein the nucleic acid encodes [the transmembrane domain of SEQ ID NO:1] amino acids 563-812 of SEQ ID NO:1.

A4

Sub C4

17. (once amended) The isolated nucleic acid of claim 14, wherein the nucleic acid further encodes a cytoplasmic domain comprising greater than about 70% amino acid identity to [the cytoplasmic domain of SEQ ID NO:1] amino acids 812 to 840 of SEQ ID NO:1.

18. (once amended) The isolated nucleic acid of claim 17, wherein the nucleic acid encodes [the cytoplasmic domain of SEQ ID NO:1] amino acids 812 to 840 of SEQ ID NO:1.

Sub C6

A5

61. (once amended) A method of making a sensory transduction G-protein coupled receptor, the method comprising the step of expressing the receptor from a recombinant expression vector comprising a nucleic acid encoding the receptor, wherein the amino acid sequence of the receptor comprises greater than about 70% amino acid identity to a polypeptide having a sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the receptor

specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

62. (once amended) A method of making a recombinant cell comprising a sensory transduction G-protein coupled receptor, the method comprising the step of transducing the cell with an expression vector comprising a nucleic acid encoding the receptor, wherein the amino acid sequence of the receptor comprises greater than about 70% amino acid identity to a polypeptide having a sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the receptor specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

63. (once amended) A method of making an recombinant expression vector comprising a nucleic acid encoding a sensory transduction G-protein coupled receptor, the method comprising the step of ligating to an expression vector a nucleic acid encoding the receptor, wherein the amino acid sequence of the receptor comprises greater than about 70% amino acid identity to a polypeptide having a sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the receptor specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3

REMARKS

With this amendment, claims 1-63 are pending in the application. Claims 1-18, 34-35, and 61-63 have been examined. Claims 19-33 and 36-60, drawn to a non-elected invention, are withdrawn from consideration. All pending claims are provided in Appendix I for the Examiner's convenience.

1. Status of the claims

Claims 1, and 61-63 have been amended to recite that the receptor specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

This amendment adds no new matter. Support for this amendment can be found, e.g., in claim 2 as originally filed.

Claim 9 has been amended to recite stringent hybridization conditions. This amendment adds no new matter. Support for this amendment can be found, e.g., in the specification on page 23, line 18.

Claim 10 has been amended to recite moderately stringent hybridization conditions. This amendment adds no new matter. Support for this amendment can be found, e.g., on page 23, line 25.

Claims 11 and 13 have been amended to recite the amino acids corresponding to the extracellular domain of SEQ ID NO:1. This amendment adds no new matter. Support for this amendment can be found, e.g., in the specification on page 12, lines 33-34.

Claims 14 and 16 have been amended to recite the amino acids corresponding to the transmembrane domain of SEQ ID NO:1. This amendment adds no new matter. Support for this amendment can be found, e.g., in the specification on page 13, lines 8-9.

Claims 17 and 18 have been amended to recite the amino acids corresponding to the cytoplasmic domain of SEQ ID NO:1. This amendment adds no new matter. Support for this amendment can be found, e.g., in the specification on page 13, lines 11-12.

2. Priority

The present application claims priority to USSN 60/094,464, filed July 28, 1998.

3. Specification

The disclosure was objected to as making reference to several US patent applications. The status of these applications remains the same. However, as requested by the Examiner, Applicants will update the status of the applications as they change.

4. Rejection under 35 U.S.C. § 112, second paragraph

"Stringent conditions"

Claims 7, 9, and 10 have been rejected as allegedly indefinite for reciting the phrase "stringent conditions." The rejection states that the term is confusing because it "encompasses conditions of varying degrees of stringency." The rejection further claims that stringent conditions are not clearly defined in the specification. To expedite prosecution, claims 9 and 10 have been amended to recite stringent hybridization conditions, as defined in the specification. Applicants therefore respectfully request that the rejection be withdrawn with respect to claims 9 and 10.

Furthermore, with respect to claim 7, Applicants respectfully traverse the rejection. In the context of PCR reactions that use degenerate primers based on amino acid sequences, one of skill in the art would understand the phrase "stringent hybridization conditions" as referring to standard conditions for such reactions, thereby meeting the threshold clarity and precision standards of the statute. MPEP § 2173.02. As described by the court in *In re Chilowsky*,

> It is well settled that the disclosure of an application embraces not only what is expressly set forth in words or drawings, but what would be understood by persons skilled in the art. . . . That which is common and well known is as if it were written out in the patent. *In re Chilowsky*, 108 USPQ 321, 324 (C.C.P.A. 1956).

The present application discloses to the use of degenerate primers to amplify nucleic acids. The present application further discloses prior art materials that teach standard conditions for reactions using degenerate primers (*see, e.g.*, specification page 28, lines 3-16, referring, e.g., to *PCR Protocols: A Guide to Methods and Applications*, (Innis *et al.*, eds., 1990)). One of skill in the art would therefore clearly understand that phrase "stringent conditions," as used in the context of PCR reactions using degenerate primers, refers to standard conditions known to those of skill in the art. Applicants therefore respectfully request that the rejection be withdrawn.

"Transmembrane domain," "extracellular domain," and "cytoplasmic domain"

Claims 11-18 have been rejected as allegedly indefinite for reciting the phrases "transmembrane domain," "extracellular domain," and "cytoplasmic domain." To expedite prosecution, the claims have been amended to recite the amino acid residues defining each domain, as described in the specification. Applicants therefore respectfully request that the rejection be withdrawn.

5. Rejection under 35 U.S.C. § 112, first paragraph

Claims 1, 3, 6, 8, 10-12, 14-18, 34, 35, and 61-63 were rejected as allegedly enabled in scope only for polynucleotides encoding a polypeptide of SEQ ID NOS: 1, 2, or 3, and antigenic fragments thereof, and polynucleotides that hybridize under stringent conditions to the polynucleotides of SEQ ID NOS:4, 5, and 6. *See* Office Action, page 6. To the extent that the rejection applies to the claims as amended, Applicants respectfully traverse.

The rejection states that polynucleotides that hybridize under stringent conditions to SEQ ID NO:4, 5, or 6 are useful as tissue specific markers because the nucleic acids and the proteins that they encode are specifically expressed in specialized taste cells of the tongue. Office Action, page 7. Accordingly, to expedite prosecution, the claims have been amended to recite polynucleotides that hybridize under stringent conditions to SEQ ID NO:4, 5, or 6.

Furthermore, the rejection states that polynucleotides that encode a polypeptide of SEQ ID NO:1, 2, or 3 or an antigenic fragment thereof (i.e., one that would bind to a polyclonal antibody raised against SEQ ID NO:1, 2, or 3) would be useful as tissue specific markers, even if these polynucleotides did not hybridize under stringent conditions to SEQ ID NO:4, 5, or 6. Office Action, page 7. Accordingly, to expedite prosecution, Applicants have amended the claims to recite polynucleotides that encode a polypeptide of SEQ ID NO:1, 2, or 3 or an antigenic fragment thereof (i.e., one that would bind to a polyclonal antibody raised against SEQ ID NO:1, 2, or 3). As the scope of the claims is commensurate with the enablement provided by the specification, according to the Examiner's comments, Applicants therefore respectfully request that the rejection be withdrawn.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,

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1. (once amended) An isolated nucleic acid encoding a sensory transduction G-protein coupled receptor, the receptor comprising greater than about 70% amino acid identity to an amino acid sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the nucleic acid encodes a receptor that specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

2. (canceled)

3. (as filed) The isolated nucleic acid of claim 1, wherein the nucleic acid encodes a receptor that has G-coupled protein receptor activity.

4. (as filed) The isolated nucleic acid of claim 1, wherein the nucleic acid encodes a receptor comprising an amino acid sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

5. (as filed) The isolated nucleic acid sequence of claim 1, wherein the nucleic acid comprises a nucleotide sequence of SEQ ID NO:4, SEQ ID NO:5, or SEQ ID NO:6.

6. (as filed) The isolated nucleic acid of claim 1, wherein the nucleic acid is from a human, a mouse, or a rat.

7. (as filed) The isolated nucleic acid of claim 1, wherein the nucleic acid is amplified by primers that selectively hybridize under stringent hybridization conditions to the same sequence as degenerate primer sets encoding amino acid sequences selected from the group consisting of:

IAWDWNGPKW (SEQ ID NO:7) and

LPENYNEAKC (SEQ ID NO:8).

8. (as filed) The isolated nucleic acid of claim 1, wherein the nucleic acid encodes a receptor having a molecular weight of about between 92 kDa to about 102 kDa.

9. (once amended) An isolated nucleic acid encoding a sensory transduction G-protein coupled receptor, wherein the nucleic acid specifically hybridizes under highly stringent conditions, which end with a wash step at 65°C in a solution comprising 0.2x SSC and 0.1% SDS, to a nucleic acid having the sequence of SEQ ID NO:4, SEQ ID NO:5, or SEQ ID NO:6.

10. (once amended) An isolated nucleic acid encoding a sensory transduction G-protein coupled receptor, the receptor comprising greater than about 70% amino acid identity to a polypeptide having a sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the nucleic acid selectively hybridizes under moderately stringent hybridization conditions, which end with a wash step at 45°C in a solution comprising 1x SSC, to a nucleotide sequence of SEQ ID NO:4, SEQ ID NO:5, or SEQ ID NO:6.

11. (once amended) An isolated nucleic acid encoding an extracellular domain of a sensory transduction G-protein coupled receptor, the extracellular domain having greater than about 70% amino acid sequence identity to amino acids 1-563 of SEQ ID NO:1, wherein the extracellular domain specifically binds to polyclonal antibodies generated against amino acids 1-563 of SEQ ID NO:1.

12. (as filed) The isolated nucleic acid of claim 11, wherein the nucleic acid encodes the extracellular domain linked to a nucleic acid encoding a heterologous polypeptide, forming a chimeric polypeptide.

13. (once amended) The isolated nucleic acid of claim 11, wherein the nucleic acid encodes amino acids 1-563 of SEQ ID NO:1.

14. (once amended) An isolated nucleic acid encoding a transmembrane domain of a sensory transduction G-protein coupled receptor, the transmembrane domain comprising greater than about 70% amino acid sequence identity to amino acids 563 to 812 of SEQ ID NO:1, wherein the transmembrane domain specifically binds to polyclonal antibodies generated against amino acids 563-812 of SEQ ID NO:1.

15. (as filed) The isolated nucleic acid of claim 14, wherein the nucleic acid encodes the transmembrane domain linked to a nucleic acid encoding a heterologous polypeptide, forming a chimeric polypeptide.

16. (once amended) The isolated nucleic acid of claim 14, wherein the nucleic acid encodes amino acids 563-812 of SEQ ID NO:1.

17. (once amended) The isolated nucleic acid of claim 14, wherein the nucleic acid further encodes a cytoplasmic domain comprising greater than about 70% amino acid identity to amino acids 812 to 840 of SEQ ID NO:1.

18. (once amended) The isolated nucleic acid of claim 17, wherein the nucleic acid encodes amino acids 812 to 840 of SEQ ID NO:1.

19. (withdrawn) An isolated sensory transduction G-protein coupled receptor, the receptor comprising greater than about 70% amino acid sequence identity to an amino acid sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

20. (withdrawn) The isolated receptor of claim 19, wherein the receptor specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

21. (withdrawn) The isolated receptor of claim 19, wherein the receptor has G-protein coupled receptor activity.

22. (withdrawn) The isolated receptor of claim 19, wherein the receptor has an amino acid sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

23. (withdrawn) The isolated receptor of claim 19, wherein the receptor is from a human, a rat, or a mouse.

24. (withdrawn) An isolated polypeptide comprising an extracellular domain of a sensory transduction G-protein coupled receptor, the extracellular domain comprising greater than about 70% amino acid sequence identity to the extracellular domain of SEQ ID NO:1.

25. (withdrawn) The isolated polypeptide of claim 24, wherein the polypeptide encodes the extracellular domain of SEQ ID NO:1.

26. (withdrawn) The isolated polypeptide of claim 24, wherein the extracellular domain is covalently linked to a heterologous polypeptide, forming a chimeric polypeptide.

27. (withdrawn) An isolated polypeptide comprising a transmembrane domain of a sensory transduction G-protein coupled receptor, the transmembrane domain comprising

greater than about 70% amino acid sequence identity to the transmembrane domain of SEQ ID NO:1.

28. (withdrawn) The isolated polypeptide of claim 27, wherein the polypeptide encodes the transmembrane domain of SEQ ID NO:1.

29. (withdrawn) The isolated polypeptide of claim 27, further comprising a cytoplasmic domain comprising greater than about 70% amino acid identity to the cytoplasmic domain of SEQ ID NO:1.

30. (withdrawn) The isolated polypeptide of claim 29, wherein the polypeptide encodes the cytoplasmic domain of SEQ ID NO:1.

31. (withdrawn) The isolated polypeptide of claim 27, wherein the transmembrane domain is covalently linked to a heterologous polypeptide, forming a chimeric polypeptide.

32. (withdrawn) The isolated polypeptide of claim 31, wherein the chimeric polypeptide has G-protein coupled receptor activity.

33. (withdrawn) An antibody that selectively binds to the receptor of claim 19.

34. (as filed) An expression vector comprising the nucleic acid of claim 1.

35. (as filed) A host cell transfected with the vector of claim 34.

36. (withdrawn) A method for identifying a compound that modulates sensory signaling in sensory cells, the method comprising the steps of:

(i) contacting the compound with a polypeptide comprising an extracellular domain of a sensory transduction G-protein coupled receptor, the extracellular domain comprising greater than about 70% amino acid sequence identity to the extracellular domain of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3; and

(ii) determining the functional effect of the compound upon the extracellular domain.

37. (withdrawn) The method of claim 36, wherein the polypeptide is a sensory transduction G-protein coupled receptor, the receptor comprising greater than about 70% amino acid identity to a polypeptide encoding SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

38. (withdrawn) The method of claim 37, wherein the polypeptide comprises an extracellular domain that is covalently linked to a heterologous polypeptide, forming a chimeric polypeptide.

39. (withdrawn) The method of claim 37 or 38, wherein the polypeptide has G-protein coupled receptor activity.

40. (withdrawn) The method of claim 36, wherein the extracellular domain is linked to a solid phase.

41. (withdrawn) The method of claim 40, wherein the extracellular domain is covalently linked to a solid phase.

42. (withdrawn) The method of claim 37 or 38, wherein functional effect is determined by measuring changes in intracellular cAMP, IP3, or Ca2+.

43. (withdrawn) The method of claim 36, wherein the functional effect is a chemical effect.

44. (withdrawn) The method of claim 36, wherein the functional effect is a physical effect.

45. (withdrawn) The method of claim 36, wherein the functional effected is determined by measuring binding of the compound to the extracellular domain.

46. (withdrawn) The method of claim 36, wherein the polypeptide is recombinant.

47. (withdrawn) The method of claim 36, wherein the polypeptide is from a rat, a mouse, or a human.

48. (withdrawn) The method of claim 37, wherein the polypeptide comprises an amino acid sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

49. (withdrawn) The method of claim 37 or 38, wherein the polypeptide is expressed in a cell or cell membrane.

50. (withdrawn) The method of claim 49, wherein the cell is a eukaryotic cell.

51. (withdrawn, previously once amended) A method for identifying a compound that modulates sensory signaling in sensory cells, the method comprising the steps of:

(i) contacting the compound with a polypeptide comprising a transmembrane domain of a sensory transduction G-protein coupled receptor, the transmembrane domain

comprising greater than about 70% amino acid sequence identity to the transmembrane domain of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3; and

(ii) determining the functional effect of the compound upon the transmembrane domain.

52. (withdrawn) The method of claim 51, wherein the polypeptide comprises an transmembrane domain that is covalently linked to a heterologous polypeptide, forming a chimeric polypeptide.

53. (withdrawn) The method of claim 52, wherein the chimeric polypeptide has G-protein coupled receptor activity.

54. (withdrawn) The method of claim 51, wherein the functional effect is determined by measuring changes in intracellular cAMP, IP3, or Ca2+.

55. (withdrawn) The method of claim 51, wherein the functional effect is a chemical effect.

56. (withdrawn) The method of claim 51, wherein the functional effect is a physical effect.

57. (withdrawn) The method of claim 51, wherein the polypeptide is recombinant.

58. (withdrawn) The method of claim 51, wherein the polypeptide is from a rat, a mouse, or a human.

59. (withdrawn) The method of claim 51 or 52, wherein the polypeptide is expressed in a cell or cell membrane.

60. (withdrawn) The method of claim 59, wherein the cell is a eukaryotic cell.

61. (once amended) A method of making a sensory transduction G-protein coupled receptor, the method comprising the step of expressing the receptor from a recombinant expression vector comprising a nucleic acid encoding the receptor, wherein the amino acid sequence of the receptor comprises greater than about 70% amino acid identity to a polypeptide having a sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the receptor specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

62. (once amended) A method of making a recombinant cell comprising a sensory transduction G-protein coupled receptor, the method comprising the step of transducing the cell with an expression vector comprising a nucleic acid encoding the receptor, wherein the amino acid sequence of the receptor comprises greater than about 70% amino acid identity to a polypeptide having a sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the receptor specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

63. (once amended) A method of making an recombinant expression vector comprising a nucleic acid encoding a sensory transduction G-protein coupled receptor, the method comprising the step of ligating to an expression vector a nucleic acid encoding the receptor, wherein the amino acid sequence of the receptor comprises greater than about 70% amino acid identity to a polypeptide having a sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3, wherein the receptor specifically binds to polyclonal antibodies generated against SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.